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Simultaneous-Move Games – Survivor Style

Research shows that using popular media in the classroom can enhance students' analytical skills and engagement investigating technical topics taught in class, and enable visualization of theoretical models through real-life applications. Game theory courses are not an exception and students taking them can benefit greatly from this pedagogical approach. We illustrate this active-learning technique by using the long-running reality TV show *Survivor*. We provide examples from the TV show that highlight the most important types of simultaneous-move games, as well as how instructors can embed them into their courses. Our proposed lesson plans aim to enhance students' understanding of abstract concepts without detracting from academic rigor.

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1. Introduction

Ever since the prominent papers by Becker and Watts (1996, 2001, 2008), economics professors have been trying to revamp the traditional "chalk-and-talk" pedagogical technique. Many students assume that economics classes are difficult and abstract, with no real-world applications (Luccasen and Thomas 2010). As a result, instructors are becoming increasingly interested in incorporating movies, TV shows, books, or music into their lectures. The survey on the most important films for economic educators provided by Mateer, O'Roark, and Holder (2016) demonstrates the appeal of this innovative new way of teaching.

Game theory has vast applications in the real world, as well as in various other disciplines such as political science, business, and psychology. However, just like with any other field in economics, teaching it abstractly can seem unengaging and impersonal for students. As a result, Dixit (2005) challenges using solely a textbook in game theory classes and discusses the advantages of creating classroom games, including role-playing, computer games, movies, and TV shows. He remarks that this pedagogical approach does not detract from academic rigor, but rather leads to an improvement in student learning.

Other literature presenting how to teach game theory by using movies (Burke, Robak, & Stumph, 2018), TV shows (Geerling, Mateer, & Addler, 2020, Geerling et al., 2023), or reality television (Salter, 2014) confirms that using alternative instructional approaches is an effective way to teach central concepts in game theory. Essentially, these studies support Willingham's (2021) statement that the goal for educators should be to make students' thinking more enjoyable and more efficient. To achieve this objective, he conjectures that the cognitive work given to students must be challenging, yet feasible. We argue that using visual media and in-class experiments can pique our students' curiosity, promoting more in-depth learning rather than simple memorization of abstract facts.

Our paper explains five of the most important simultaneous-move games (the prisoner's dilemma, the chicken game, the battle of the sexes, the assurance game, and the pure coordination game) by using examples from *Survivor*. As mentioned previously, using media as a teaching tool is not a novel idea. For instance, Dixit, Skeath, and Reiley (2020) use the names of the main characters in the 1989 movie *When Harry Met Sally* to illustrate the last four game archetypes. We find examples presenting all five games from one single TV show, the longest-running reality TV show in American television – *Survivor*. Even though *Survivor*'s ratings have decreased since its premiere on May 31, 2000, due to its longevity, most people living in the U.S. are familiar with its premise. We present more details about the show in Section 2. The instructor can spend about five minutes of lecture time to acquaint students with the rules and regulations of the game. Sections 3 through 7 describe the five games in *Survivor* context. We include detailed lesson plans in these sections, as well as brief outlines of each in Appendices A through E (for instructors who want to give their students handouts for each game archetype). Simultaneous-move games describe situations in which a player makes decisions without knowing what the other player(s) choose(s) to do (thus with imperfect information). The prisoner's dilemma has only one Nash equilibrium, while the other four analyzed games are coordination games with two pure-strategy Nash equilibria. Our analyses, lesson plans, and guided in-class discussions are best suited for usage at the college level, either in introductory general economics or in introductory game theory classes. The last section of this paper concludes.

2. Survivor Explained

Survivor premiered on CBS in 2000. Instructors can show this one-minute video in class (presenting a simplistic version of the show).[1] The show introduces a group of strangers marooned in a remote location and divided into two or three tribes. Each tribe forms a mini-society, in which its members must work together to obtain food, water, and shelter. Sometimes, the producers provide them with an initial endowment.

During the first half of the game, the tribes compete against each other approximately once every three days in "reward challenges." The challenges can be physical (racing, swimming, etc.), intellectual (puzzles, quizzes, etc.), or a combination of the two. The winning tribe can gain food, tools, or comfort items as a result. They also face each other in "immunity challenges," in which the winner tribe is safe to continue in the game, while the loser tribe(s) must face a "tribal council." During the tribal council, the loser tribe must eliminate one of their members from the competition, anonymously and democratically.

After about half of all players are voted out, the second stage of the game begins. The tribes merge into one tribe and the competition becomes individual. That is, at the immunity challenges, the individual who wins is safe, while everybody else is in danger of being voted out at the tribal council. The players eliminated after the merge become members of a "jury." When only two or three players are left in the competition (after around 39 days[2]), there is a final tribal council. During this council, the jury votes for the player who deserves to win "Survivor" (and the $1,000,000 prize that comes with it).

There have been 43 seasons aired so far (with season 44 currently airing). We focus our analyses on seasons 41 and 42. Due to the international travel restrictions related to the COVID-19 pandemic, the producers pushed back the filming of season 41 by about one year and decreased its duration to 26 days. To keep it exciting for the viewers, they added new twists that force players to make decisions in competitive situations in which the outcome of their actions depends on other players' actions. These new developments make *Survivor* even more fascinating from a game theory perspective. Additionally, seasons 41 and 42 were filmed back-to-back, so that the players in season 42 could not obtain an advantage by studying the gameplay in the previous season. Let us analyze some of these twists in a game theory setup.[3]

3. The Prisoner's Dilemma

A. Theoretical Analysis

The prisoner's dilemma is a game in which two rational agents face a choice between cooperating with their partner (Decision A in Table 1) or betraying their partner (Decision B in Table 1). A rational individual would choose Decision B, which, in turn, creates a less-than-optimal outcome for the group. Instructors can explain this paradox in decision-making by discussing with the students the two-player imaginary matrix payoff in Table 1.

[1] Appendix F contains the direct links and lengths for all videos discussed in the paper.
[2] *Survivor: The Australian Outback* (season 2) is the only season lasting 42 days. All other seasons 1 through 40 are 39 days long. After COVID-19, the producers decided to go down to 26 days starting with Season 41.
[3] An example (not discussed in this paper) that could be of interest to instructors of game theory, psychology, or statistics courses is "Do or Die," in which the first player to lose an immunity challenge must make a risky decision similar to the Monty Hall problem to stay in the game.

Table 1. Prisoner's Dilemma – 2 Players

	Player 2 *(JD)*	
Player 1 *(Shan)*	Decision A	Decision B
Decision A	1, 1	-2, 2
Decision B	2, -2	-1, -1

Note: The rows and first payoffs represent Player 1. The columns and second payoffs represent Player 2.

B. Lesson from Survivor

Episode 4 of season 41 provides an example of this game. Figure 1 illustrates the names and alliances of the four players left at the Ua tribe. After Ua loses the immunity challenge, they must anonymously vote one of their own out of the game.[4]

Figure 1. Players and Alliances at Ua

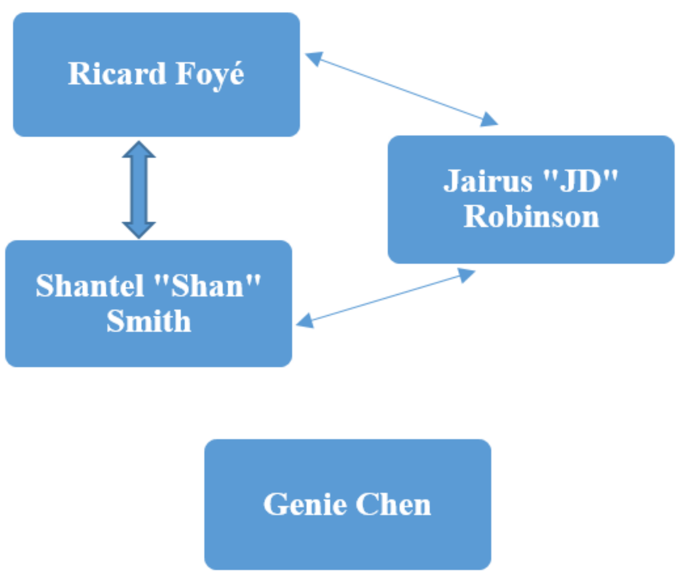

Figure 1 is a graphical representation of the players and alliances at Ua during episode 4, Season 41.

[4] There is no individual immunity at this stage of the game, so, technically, any of them could be voted out.

Ricard and Shan have shared an unwavering alliance since day 1. JD is also part of their alliance, while Genie is "on the outs." During the previous episode, JD had found an advantage and failed to share this information with Ricard and Shan. As a consequence, Ricard and Shan now perceive him as less trustworthy. Their alliance with him became weaker after that event, but they still feel closer to JD than to Genie. When Ua loses the immunity challenge in episode 4, Genie seems like the obvious vote. Let us assume that Player 1 in Table 1 is Shan, while Player 2 is JD. Decision A means being loyal to each other, while Decision B represents the opposite (i.e., vote for the other player). Students can observe that the best outcome for the two players (as a group) is to cooperate and vote Genie out. However, the instructor can emphasize that the prisoner's dilemma presents a very strong incentive for the players to defect. In the game of *Survivor*, this incentive is especially compelling, as all players' ultimate goal lies in eliminating the competition to remain the sole survivor.

C. Guided In-Class Discussion

The instructor can show this short one-minute video in class. Shan does not think about cheating at first but decides to take the opportunity when it presents itself.

The instructor can then ask the following questions:

1. What are the possible outcomes? The students should notice that the individual decision-makers have an incentive to defect rather than cooperate, given their higher payoff in that scenario. Shan rationally chooses defection and orchestrates a blindside, which leads to JD's elimination. The Nash equilibrium is not achieved here, as one player chooses cooperation and the other does not. Therefore, Shan's outcome exceeds JD's outcome.

2. What would happen if the same game were played more than once? The instructor can emphasize that our application is a true one-time prisoner's dilemma. In an iterated prisoner's dilemma scenario, Shan would have more incentive to work with JD, as explicit social punishment for her defection would move the game toward a more collectively beneficial outcome.

4. The Chicken Game

A. Theoretical Analysis

In the classic chicken game, two players drive a car towards each other. A player receives the maximum benefit if the other player is the "chicken" (i.e., swerves the car). The worst outcome for both players is obtained if neither player swerves the car (i.e., a fatal accident happens) as the negative outcome received if being called a "chicken" is not as bad as dying. There are two pure-strategy Nash equilibria, with each player preferring a different one. A player can reach his/her desired equilibrium by signaling that he/she is set on never swerving (for instance, by disassembling the steering wheel). Thus, a pure-strategy Nash equilibrium is achieved if and only if each of the players is confident in the other player's choice (i.e., no uncertainty). The instructor can discuss with the students the matrix of this game with imaginary payoffs in Table 2.

Table 2. Chicken Game – 2 Players

	Player 2 (Daniel)	
Player 1 (Hai)	Decision A	Decision B
Decision A	0, 0	-1, 1
Decision B	1, -1	-1000, -1000

Note: The rows and first payoffs represent Player 1. The columns and second payoffs represent Player 2.

B. Lesson from Survivor

We use the tribal council in Season 42, episode 3 to illustrate this game. After the Vati tribe loses the immunity challenge, they must eliminate one tribe member. There is no individual immunity at this stage of the game, so any player could be voted off. Figure 2 shows the alliances within the tribe, as well as who lost their vote due to risky and/or unfortunate previous decisions.

Figure 2. Players and Alliances at Vati

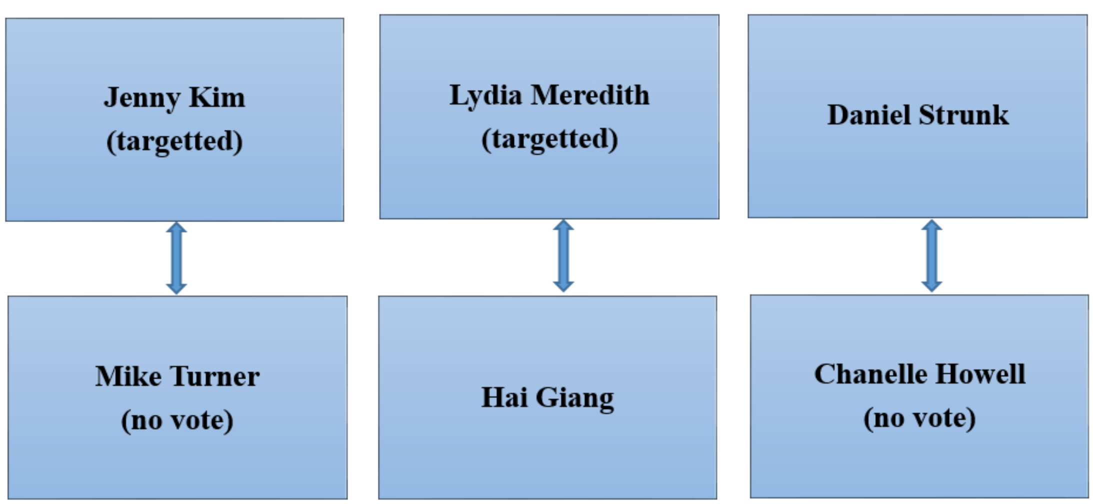

Figure 2 is a graphical representation of the players and alliances at Vati during episode 3, Season 42.

For clarity, we also present the votes of each tribe member in Figure 3.

Figure 3. Votes at Vati

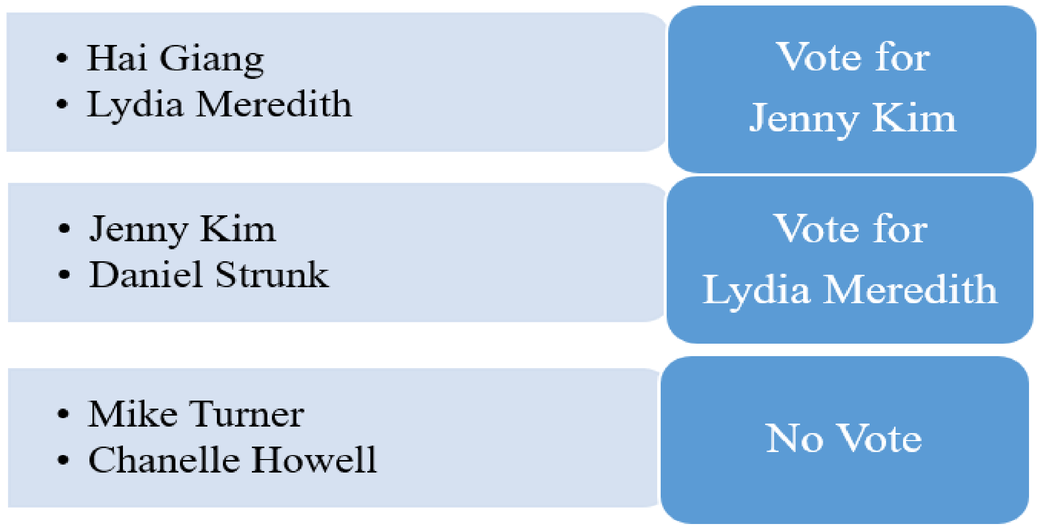

Figure 3 shows for whom each of the six tribe members of Vati voted during episode 3, Season 42.

We can draw the following conclusions from Figures 2 and 3:

- There are three main alliances.
- Mike and Chanelle do not have a vote, leaving only four tribemates with a right to vote.
- Jenny and Mike want Lydia out (but Mike does not have a vote).
- Lydia and Hai want Jenny out.
- Daniel and Chanelle are the "swing alliance" (but Chanelle does not have a vote).

Before the tribal council, back at camp, Jenny and Mike manage to convince Daniel to vote with them. That leads to two votes for Jenny (from Lydia and Hai) and two votes for Lydia (from Jenny and Daniel).

In case of a tie between Jenny and Lydia, Daniel and Hai (the only other tribe mates with a right to vote) must vote again. If the tie remains, they must reach an agreement. If no agreement is reached, Jenny and Lydia are safe, while Daniel and Hai "go to rocks" (i.e., one of the formerly safe players is eliminated through a random draw of rocks).

In other words, Daniel and Hai face a chicken game, in which neither wants to change his vote. However, if neither changes his vote, the results could be fatal for their life on *Survivor* (i.e., one of them could be eliminated).

C. Guided In-Class Discussion

The instructor can ask the students the following questions:

1. Is this a chicken game? The instructor can guide the students to see that, if Hai represents player 1 and Daniel is player 2 (in Table 2), Decision A can signify "change his vote", while

Decision B means "does not change his vote".

2. The instructor can then ask two volunteers to play the roles of Hai and Daniel. What would they do? What kind of signal can they send to obtain their preferred outcome?

The instructor can then play the tribal council in two parts: part 1 and part 2 (total length of the two videos is 8.5 minutes). Note that Hai is familiar with the chicken game, and he decides to signal his unwillingness to change his vote. This forces Daniel to be the "chicken," which leads to Jenny's elimination.

5. The Battle of the Sexes

A. Theoretical Analysis

The battle of the sexes is a two-player game in which the two players need to cooperate, but each player prefers a different outcome. We present an imaginary example of possible payoffs in Table 3. Note that player 1 prefers the outcome in the bottom right corner, while player 2 prefers the top left corner. As their preferences are different, there are two Nash equilibria with asymmetric payoffs. Both players should choose the same option since a coordination failure leads to the lowest payoffs for both of them.

Table 3. Battle of the Sexes Game – 2 Players

	Player 2 *(Mike)*	
Player 1 *(Rest of the tribe)*	Decision A	Decision B
Decision A	2, 5	0, 0
Decision B	0, 0	5, 2

Note: The rows and first payoffs represent Player 1. The columns and second payoffs represent Player 2.

B. Lesson from Survivor

Survivor 42, episode 1 shows an example of this game. After losing the first challenge, the Vati tribe needs to reach a decision unanimously. They need to choose between "savvy" (Decision A in Table 3) and "sweat" (Decision B) to receive some basic supplies necessary to survive on the island (a pot, a machete, and flint). The "savvy" option involves completing a puzzle as a tribe. With the "sweat" option, only one member of the tribe needs to fill a 55-gallon barrel of water by using a heavy pot in which he/she would carry water from the sea. During this time, this tribe member is separated from the rest.

At Vati, the fittest person is Mike. He quickly realizes that choosing "sweat" means that he would be the one to perform it, while everybody else would conserve their energy, bond with each other, form alliances, etc. In Table 3, player 2 is Mike, while player 1 represents the rest of the tribe (which, we assume, would prefer to let Mike do all the work). In the end, Mike convinces everybody that the tribe should pick "savvy," arguing that this would be a great bonding time for all of them as a new tribe.

C. Guided In-Class Discussion

The instructor can show this one-minute video explaining the challenge. The instructor can then ask the following questions:

1. If Mike and the tribe do not coordinate their decision, what are the outcomes?
2. If they were Mike, how would they try to convince the tribe to go with their preferred strategy?
3. Why does the tribe go with Mike's preferred strategy?

6. The Assurance Game

A. Theoretical Analysis

The assurance game is also known as the "stag hunt." An example of imaginary payoffs for this game can be found in Table 4. Each of two individuals must decide whether to hunt the stag, or the hare. To succeed in catching the stag (Decision A), they must both hunt for it. Only if both go for the stag (Decision A), can they succeed (and their payoffs are the largest both individually and collectively). If one goes for the stag (Decision A), while the other for the hare (Decision B), the stag hunter receives nothing, while the hare hunter gets the hare. If they both go for the hare, they both receive something, but the hare is worth less than the stag.

Table 4. Assurance Game – 2 Players

	Player 2 (Maryanne)	
Player 1 (Romeo)	Decision A	Decision B
Decision A	10, 10	0, 5
Decision B	5, 0	5, 4

Note: The rows and first payoffs represent Player 1. The columns and second payoffs represent Player 2.

This game has two pure-strategy Nash equilibria: one that is risk dominant (when both make Decision B) and one that is payoff dominant (when both make Decision A). For an equilibrium to be reached, the payoffs must be common knowledge and the two players must share an honest convergence of expectations. This game describes a conflict between safety and social cooperation. Therefore, trusting one another is crucial to achieve the highest payoffs.

B. Lesson from Survivor

The decision on whether to go for the biggest threat (i.e., the stag) or the safest choice (i.e., the hare) is a central part of the *Survivor* game. Players only try to vote out the "stag" if they are certain that they are coordinated with the other players.

We choose to focus on one of the biggest moves in Season 41, which ended in the successful removal of the "stag." After the individual immunity challenge in episode 12 of Season 41, the gameplay becomes exceedingly convoluted. This episode happens after the merge when there are six players left in the game. Among them, we notice two very close pairs: Lindsay and Omar on the one side, and Jonathan and Mike on the other side. Lindsay won immunity in the challenge (so she is safe) and she has a hidden immunity idol (which she does not need to play for herself, but could play for her ally). The fifth contestant is Maryanne, with a very bubbly and charming personality. Furthermore, Maryanne's social game is so convincing that both pairs believe she is in their alliance. She also has an extra vote, an advantage she had acquired previously. The last castaway, Romeo, has been flying under the radar, being perceived as "too weak" to pose any threat in the game.

Lindsay and Omar are targeting Jonathan, a very strong physical, but not so strong strategic player. Jonathan and Mike want to vote out Omar, who is perceived as the biggest threat in the game so far. However, they fear that Lindsay will use her immunity idol for him.

We present this information in Figure 4. We assume that Romeo is player 1, while Maryanne is player 2 in Table 4. Maryanne decides to make a big move and ally with Romeo to vote out the biggest threat: Omar. In this video, she convinces Mike and Jonathan to vote for Romeo, while she (with her two votes) and Romeo would vote for Omar. At one point, she expresses her certainty that Romeo will follow the plan. She also convinces (i.e., lies to) Lindsay and Omar that she will vote out Jonathan with them. In essence, Romeo and Maryanne decide to go for the stag (i.e., Omar) instead of the hare (i.e., Jonathan). Their plan only works if they have complete trust in one another.

Figure 4. Votes and Advantages in Episode 12 of Season 42

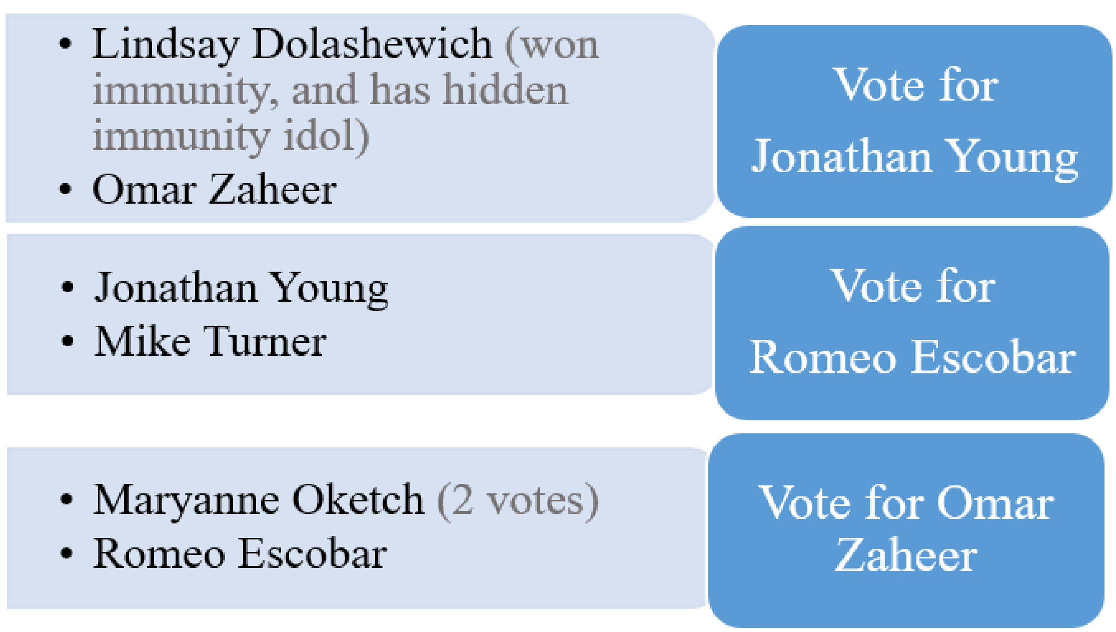

Figure 4 is a graphical representation of the players and alliances after the merge during episode 12, Season 42.

C. Guided In-Class Discussion

The instructor can ask the following questions:

1. Analyze Table 4. What happens if only Maryanne goes for the stag, while Romeo votes for the hare? How are the outcomes different than if both go for the stag?

2. Analyze Table 4. What happens if only Romeo goes for the stag, while Maryanne votes for the hare? How are the outcomes different than if both go for the stag?

3. Analyze Table 4. What happens if they both go for the hare? How are the outcomes different than if both go for the stag?[5]

7. The Pure Coordination Game

A. Theoretical Analysis

A pure coordination game is a simultaneous game in which two players must once again select between Decision A and Decision B. A player earns the highest payoff when he/she selects the same course of action as the other player. The two agents are indifferent between Decisions A and B. However, they reach a pure-strategy Nash equilibrium only if they coordinate. Therefore, this game has two pure-strategy Nash equilibria. A typical example is choosing the side of the road on which we drive. As long as all drivers drive on the right side of the road (or all drivers drive on the left side of the road) a head-on-collision is avoided.

Table 5. Pure Coordination – 2 Players

	Player 2 *(Ricard)*	
Player 1 *(Shan)*	Decision A	Decision B
Decision A	1, 1	-1, -1
Decision B	-1, -1	1, 1

Note: The rows and first payoffs represent Player 1. The columns and second payoffs represent Player 2.

B. Lesson from Survivor

In the game of *Survivor*, players must always coordinate in tribal councils, so that the vote goes their way. We picked a specific tribal in Season 41, episode 3. The Ua tribe loses the challenge. Figure 5 shows the alliances and players left in the tribe.

[5] The final three in Season 42 consisted of Maryanne, Mike, and Romeo. Maryanne won the title of Sole Survivor (and the $1,000,000 prize) with seven votes from the jury. Mike only received one vote (from his closest ally, Jonathan), while Romeo received none. If Omar would have continued in the game, things could have been very different for Maryanne. In other words, the biggest threat to her game (i.e., her stag) was without a doubt Omar.

Figure 5. Players and Alliances at Ua

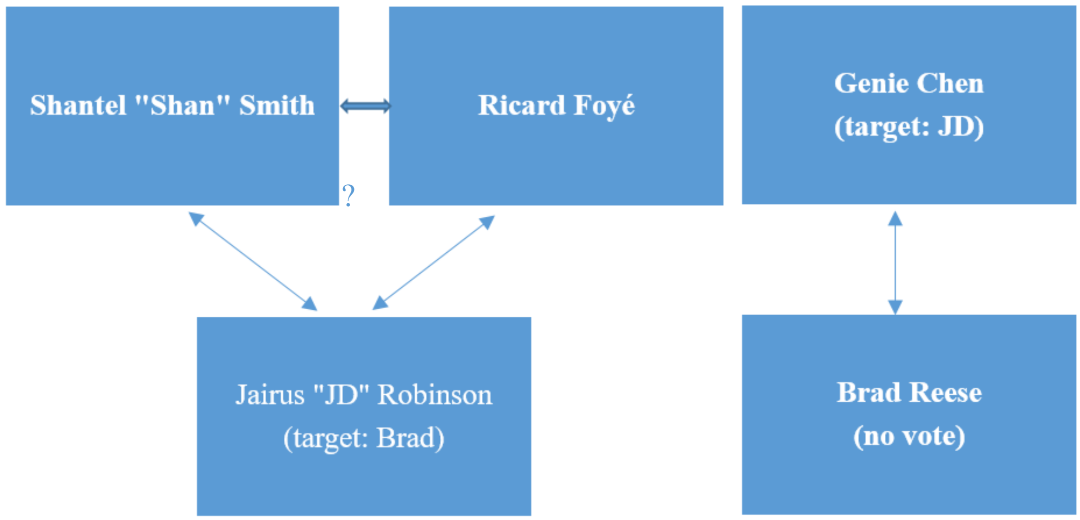

Figure 5 is a graphical representation of the players and alliances at Ua during episode 3, Season 41.

In Table 5, we assume that Player 1 is Shan and Player 2 is Ricard. Decision A signifies voting out JD, while Decision B means voting out Brad. Shan and Ricard are in a very close alliance. Brad thinks that Shan is in an alliance with him, while JD thinks he is in an alliance with both Shan and Ricard. In reality, Shan and Ricard are only devoted to one another. Shan and Ricard discuss their choices in this video. Ultimately, they decide on Decision B and vote out Brad.

C. Guided In-Class Discussion

The instructor can ask the following questions:

1. What happens if Shan and Ricard do not coordinate their decisions? Note that, in the case of a permanent tie between JD and Brad, Shan and Ricard would need to draw rocks and one of them would be eliminated (we discuss this situation in detail in section 4). Therefore, each player earns the highest payoff when he/she selects the same strategy as the other player.

2. Students can be asked to discuss the differences between the prisoner's dilemma (in which cooperation fails, producing in turn a worst outcome for the group) and the pure coordination game (in which cooperation is achieved, hence generating the best outcome for the group).

8. Conclusion

Game theory studies how strategic agents make decisions based on their preferences (or utilities), as well as other people's decisions and preferences. Instructors of game theory courses must equip students with the necessary tools that can help them better understand decision-making, an important life skill.

Research suggests that presenting new ideas and concepts in visual form makes them more accessible and more memorable for our students. Therefore, we present five of the most important simultaneous-move games by using *Survivor*, a popular reality TV show. We also describe how various situations from the show can be used to provoke discussions in the classroom and to connect theories with real-life examples.

References

Becker, W. E., & Watts, M.. 1996. Chalk and talk: A national survey of teaching undergraduate economics. *American Economic Review* 86: 448-454.

Becker, W. E., & Watts, M. 2001. Teaching economics at the start of the 21st century: Still chalk and talk. *American Economic Review* 91: 446-451. DOI: doi/10.1257/aer.91.2.446

Becker, W. E., & Watts, M. 2008. A little more than chalk and talk: results from a third national survey of teaching methods in undergraduate economics courses. *Journal of Economic Education* 39: 273-286. DOI: 10.3200/JECE.39.3.273-286

Burke, S., Robak, P., & Stumph, C. 2018. Beyond Buttered Popcorn: A Project Using Movies to Teach Game Theory in Introductory Economics. *Journal of Economics Teaching* 3: 153-161. DOI: 10.58311/jeconteach/584d5ccc75904a89286e779648a85b333e56ebd3

Dixit, A. 2005. Restoring fun to game theory. *The Journal of Economic Education* 36: 205-219. DOI: 10.3200/JECE.36.3.205-219

Dixit, A., Skeath S., & McAdams, D. 2020. Games of Strategy, Fifth Edition. *W. W. Norton & Company*.

Geerling, W., Mateer, G. D., & Addler, M. 2020. Crazy rich game theory. *International Journal of Pluralism and Economics Education* 11: 326-342. DOI: 10.2139/ssrn.3748749

Geerling, W., Nagy, K., Rhee, E., Thomas, N., & Wooten, J. 2023. Using Squid Game to Teach Game Theory. *Journal of Economics Teaching* 8: 47-63. DOI: 10.58311/jeconteach/2dfaffe5f7d50d5513a89ae4be17f4d9ff8cc3f3

Luccasen, R. A., & Thomas, M. K. 2010. Simpsonomics: Teaching economics using episodes of "The Simpsons." *The Journal of Economic Education* 41: 136-149. DOI: 10.1080/00220481003613847

Mateer, G. D., O'Roark, B., & Holder, K. 2016. The 10 greatest films for teaching economics. *The American Economist* 61: 204-216. DOI: 10.1177/0569434516653749

Salter, M. B. 2014. Teaching Prisoners' Dilemma Strategies in Survivor: Reality Television in the IR Classroom. *International Studies Perspectives* 15: 359-373. DOI: 10.1111/j.1528-3585.2012.00506.x

Willingham, D. T. 2021. Why don't students like school? A cognitive scientist answers questions about how the mind works and what it means for the classroom. *John Wiley & Sons*.

Appendix A. Prisoner's Dilemma – Lesson Plan

The prisoner's dilemma is a game in which two rational agents face a choice between cooperating with their partner (Decision A in Table 1) or betraying their partner (Decision B in Table 1). A rational individual would choose Decision B, which, in turn, creates a less-than-optimal outcome for the group.

	Player 2 (JD)	
Player 1 (Shan)	Decision A (Cooperate)	Decision B (Defect)
Decision A (Cooperate)	1, 1	-2, 2
Decision B (Defect)	2, -2	-1, -1

Watch this short one-minute video in class. Shan and JD could vote together (vote Genie out), or not. Notice that there are four possible situations.

1. What are the possible outcomes? When does Shan obtain the highest possible outcome?
2. What do you think would happen if the same game were played more than once?

Appendix B. Chicken Game – Lesson Plan

In the classic chicken game, two players drive a car towards each other. A player receives the maximum benefit if the other player is the "chicken" (i.e., swerves the car). The worst outcome for both players is obtained if neither player swerves the car (i.e., a fatal accident happens) because the negative outcome received if being called a "chicken" is not as bad as dying. A player can reach his/her desired equilibrium by signaling that he/she is set on never swerving (for instance, by disassembling the steering wheel).

	Player 2 (Daniel)	
Player 1 (Hai)	Decision A (Swerve)	Decision B (Go straight)
Decision A (Swerve)	0, 0	-1, 1
Decision B (Go straight)	1, -1	-1000, -1000

Watch the tribal council in two parts: part 1 and part 2 (total length of the two videos is 8.5 minutes). Hai decides to signal his unwillingness to swerve, which induces Daniel to swerve (i.e., change his vote) to avoid a head-on collision.

1. Is this a chicken game?
2. What could Daniel do to not become the "chicken"?

Appendix C. Battle of the Sexes – Lesson Plan

The battle of the sexes is a two-player game in which the two players need to cooperate, but each player prefers a different outcome. In the table below, note that Player 1 prefers the outcome in the bottom right corner, while Player 2 prefers the top left corner. Both players should choose the same option since a coordination failure leads to the lowest payoffs for both of them.

	Player 2 (Mike)	
Player 1 (Rest of the tribe)	Decision A (Savvy)	Decision B (Sweat)
Decision A (Savvy)	2, 5	0, 0
Decision B (Sweat)	0, 0	5, 2

Watch this one-minute video explaining the challenge.

1. If Mike and the tribe do not coordinate their decision, what are the outcomes?
2. If they were Mike, how would they try to convince the tribe to go with their preferred strategy?
3. Why does the tribe go with Mike's preferred strategy?

Appendix D. Assurance Game – Lesson Plan

The assurance game is also known as the "stag hunt." Each of two individuals must decide whether to hunt the stag or the hare. Only if both go for the stag (Decision A), can they succeed (and their payoffs are the largest both individually and collectively). If one goes for the stag (Decision A), while the other for the hare (Decision B), the stag hunter receives nothing, while the hare hunter gets the hare. If they both go for the hare, they both receive something, but the hare is worth less than the stag.

	Player 2 (Maryanne)	
Player 1 (Romeo)	Decision A (Stag)	Decision B (Hare)
Decision A (Stag)	10, 10	0, 5
Decision B (Hare)	5, 0	5, 4

Watch this video, in which Maryanne expresses her certainty that Romeo will follow with the plan to vote for the stag (i.e., the biggest threat in the game at that point, Omar) instead of going for the hare (i.e., Jonathan).

The figure on the other side shows all the players, their advantages and the way they voted.

1. Analyze the table and the figure. What happens if only Maryanne goes for the stag, while Romeo votes for the hare? How are the outcomes different than if both go for the stag?
2. Analyze the table and the figure. What happens if only Romeo goes for the stag, while Maryanne votes for the hare? How are the outcomes different than if both go for the stag?

3. Analyze the table and the figure. What happens if they both go for the hare? How are the outcomes different than if both go for the stag?

Appendix E. Pure Coordination Game – Lesson Plan

A pure coordination game is a simultaneous game in which two players must select between Decision A and Decision B. A player earns the highest payoff when he/she selects the same course of action as the other player. A typical example is choosing the side of the road on which we drive. As long as all drivers drive on the right side of the road (or all drivers drive on the left side of the road) a head-on-collision is avoided.

	Player 2 (Ricard)	
Player 1 (Shan)	Decision A (JD)	Decision B (Brad)
Decision A (JD)	1, 1	-1, -1
Decision B (Brad)	-1, -1	1, 1

Shan and Ricard discuss their choices in this video.

1. What happens if Shan and Ricard do not coordinate their decisions? Note that, in the case of a permanent tie between JD and Brad, Shan and Ricard would need to draw rocks and one of them would be eliminated.

2. Discuss the differences between the prisoner's dilemma (in which cooperation fails, producing, in turn, the worst outcome for the group) and the pure coordination game (in which cooperation is achieved, hence generating the best outcome for the group).

Appendix F. Direct Links to Videos

Section	**Description of video**	**Link**	**Length of video**
Section 2	Explanation of the show	https://criticalcommons.org/view?m=f2AoHZlpf	1 minute
Section 3	Shan's and JD's prisoner's dilemma	https://criticalcommons.org/view?m=0FMsPOAzD	1 minute
Section 4	Han's and Daniel's chicken game (part 1)	https://criticalcommons.org/view?m=dk9MmpfoS	4 minutes
Section 4	Han's and Daniel's chicken game (part 2)	https://criticalcommons.org/view?m=Ytz1wm2ep	4.5 minutes
Section 5	"Sweat" vs. "Savvy" challenge	https://criticalcommons.org/view?m=89YERZ3O5	1 minute
Section 6	Maryanne goes for the stag	https://criticalcommons.org/view?m=m8LVbYDWw	1 minute
Section 7	Shan and Ricard coordinate	https://criticalcommons.org/view?m=qiXKCQA6s	1 minute